

## **AMENDMENTS TO THE CLAIMS**

This listing of claims will replace all prior versions, and listings, of claims in the application.

### **Listing of Claims**

Claims 1-25 (Canceled).

Claim 26 (Previously Presented): A tunable cavity resonator comprising:

a substrate;

a moveable membrane disposed in substantially parallel relationship to said substrate and suspended relative thereto at the periphery of the membrane by a support structure;

a pair of reflectors, one being a first reflector layer disposed in fixed relationship upon the substrate and the other being a second reflector layer disposed on the suspended deformable membrane to form a resonant cavity, the reflectors being disposed a cavity length from each other;

the membrane and one reflector being shaped in accordance with a prescribed membrane geometry; and

a pair of electrodes either being constituted by the reflectors or being juxtaposed therewith, one electrode with the one reflector and the other electrode with the other reflector;

wherein the suspended moveable membrane is of substantially uniform thickness and has an intrinsic stress to permit electrostatic displacement of the membrane over distances for tuning in the infrared band using voltages applied to the electrodes commensurate with read out integrated circuit electronics associated with the resonator, and

wherein the intrinsic stress of the membrane is an intrinsic tensile stress adapted to be compensated by a compressive stress applied thereto such that the resultant stress in the membrane is substantially zero or sufficiently low to permit said electrostatic displacement.

Claim 27 (Previously Presented): A resonator as claimed in claim 26, wherein said substrate is a semiconductor system that provides access to the optical wavelengths necessary for resonance purposes in the resonant cavity.

Claim 28 (Original): A resonator as claimed in claim 27, wherein said cavity length corresponds to optical wavelengths in the infrared region.

Claim 29 (Previously Presented): A resonator as claimed in claim 26, wherein the displacement of the suspended moveable membrane can be up to the full cavity length, which is correspondingly larger to accommodate such displacement without the membrane contacting the one reflector.

Claim 30 (Previously Presented): A resonator as claimed in claim 26, wherein said membrane is formed of silicon nitride.

Claim 31 (Previously Presented): A resonator as claimed in claim 26, wherein said support structure is formed of zinc sulphide.

Claim 32 (Currently Amended): A ~~tunable cavity~~ resonator as claimed in claim 26, comprising:

~~a substrate;~~

~~a moveable membrane disposed in substantially parallel relationship to said substrate and suspended relative thereto at the periphery of the membrane by a support structure;~~

~~a pair of reflectors, one being a first reflector layer disposed in fixed relationship upon the substrate material and the other being a second reflector layer disposed on the suspended deformable membrane to form a resonant cavity, the reflectors being disposed a cavity length from each other;~~

~~the membrane and one reflector being shaped in accordance with a prescribed membrane geometry; and~~

~~a pair of electrodes either being constituted by the reflectors or being juxtaposed therewith, one electrode with the one reflector and the other electrode with the other reflector, wherein the suspended moveable membrane is of substantially uniform thickness and has an intrinsic stress to permit electrostatic displacement of the membrane over distances for tuning in the infrared band using voltages applied to the electrodes commensurate with read out integrated circuit electronics associated with the resonator, and~~  
wherein said substrate is formed from an infrared sensitive material.

Claim 33 (Previously Presented): A resonator as claimed in claim 32, wherein said substrate is formed of mercury cadmium telluride (MCT).

Claim 34 (Previously Presented): A resonator as claimed in claim 26, wherein said electrodes are formed separately of the reflective layers.

Claim 35 (Previously Presented): A resonator as claimed in claim 26, wherein said reflective layers are formed to function as said electrodes.

Claims 36-60 (Canceled).

Claim 61 (Previously Presented): A tunable cavity resonator comprising:  
a substrate;  
a moveable membrane disposed in substantially parallel relationship to the substrate and suspended relative thereto at the periphery of the membrane by a support structure;  
a pair of reflectors, one being a first reflector layer disposed in fixed relationship upon the substrate and the other being a second reflector layer disposed on the suspended deformable membrane to form a resonant cavity, the reflectors being disposed a cavity length from each other; and  
a pair of electrodes either being constituted by the reflectors or being juxtaposed therewith, one electrode with the one reflector and the other electrode with the other reflector;

wherein the suspended moveable membrane is of substantially uniform thickness and has an intrinsic stress to permit electrostatic displacement of the membrane for tuning in the infrared band using voltages applied to the electrodes, and

wherein the intrinsic stress of the membrane is an intrinsic tensile stress adapted to be compensated by a compressive stress applied thereto such that the resultant stress in the membrane is substantially zero or sufficiently low to permit the electrostatic displacement.

Claim 62 (Previously Presented): A resonator as claimed in claim 26, wherein the membrane is substantially flat when suspended and not deformed due to electrostatic forces.

Claim 63 (Previously Presented): A resonator as claimed in claim 61, wherein the membrane is substantially flat when suspended and not deformed due to electrostatic forces.